

TMDLs for Turbidity, Sediment, TSS, Chloride, Sulfate, and TDS for Subsegments 100309, 100602, and 100603 in the Red River Basin, Louisiana Fact Sheet

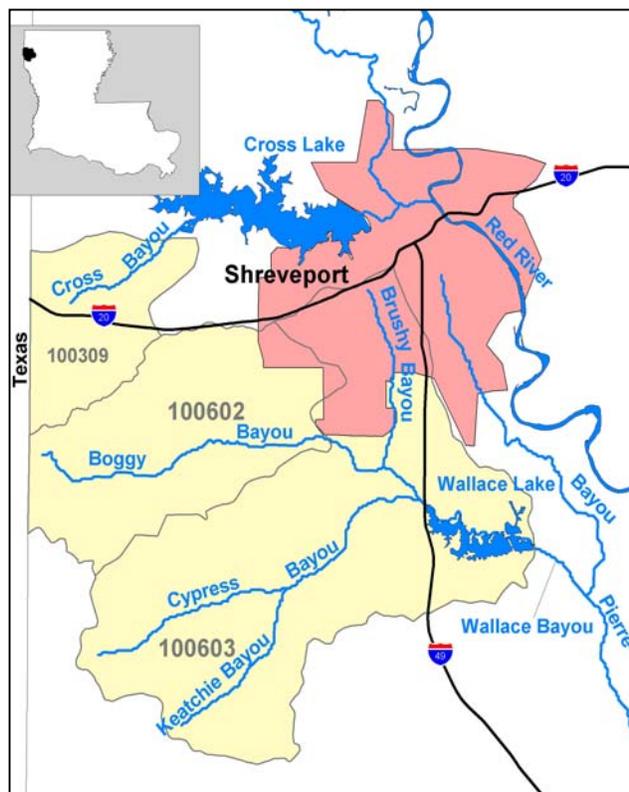


Figure 1. Location of impaired subsegments in the Red River Basin included in this report

This report presents TMDLs that have been developed for turbidity, total suspended solids (TSS), chloride, sulfate, and total dissolved solids (TDS) for Cross Bayou (subsegment 100309); and turbidity and sediment/siltation for Boggy Bayou (subsegment 100602) and Wallace Lake (subsegment 100603).

All three of these subsegments are located in the Red River basin in northwestern Louisiana. Cross Bayou (subsegment 100309) is located upstream of Cross Lake, west of Shreveport, Louisiana. The watershed for this subsegment is 38 mi², and is primarily forested. Boggy Bayou is a tributary to Wallace Lake, located south of Shreveport, Louisiana. The watershed for Boggy Bayou (subsegment 100602) is approximately 79 mi², and is also primarily forest land. The Wallace Lake subsegment (100603), located south of Shreveport, Louisiana is a little over half forested, with significant amounts of land in pasture and urban land uses.

These waterbodies were included on the Louisiana Department of Environmental Quality (LDEQ) final 2004 303(d) list as not supporting their fish and wildlife propagation designated use, and, for Cross Bayou, drinking water supply (shown below in Table 1).

The numeric water quality criteria that apply to the impaired subsegments in the Red River Basin and that were used to calculate the total allowable pollutant loads are shown below in Table 1.

These TMDLs were developed using a load duration curve method. This method determines allowable pollutant loadings for the range of measured streamflow conditions. There are four steps for applying this methodology. First a flow duration curve is developed using flows observed at a USGS flow gage on the impaired stream or as close as possible to it. Next the flow duration curve is converted to a load duration curve by multiplying the measured flow by a target concentration. The target concentration most often is a water quality standard (as in the case of TDS, sulfate, and chlorides). A target concentration for TSS (for which there is no water quality criterion) was estimated

Section 303(d) of the Clean Water Act and the U.S. Environmental Protection Agency's Water Quality Planning and Management Regulations (Title 40 of the *Code of Federal Regulations* [CFR] Part 130) require states to develop Total Maximum Daily Loads (TMDLs) for waterbodies that are not meeting water quality standards. A TMDL establishes the amount of a pollutant that a waterbody can assimilate without exceeding its water quality standard for that pollutant. TMDLs provide the scientific basis for a state to establish water quality-based controls to reduce pollution from both point and nonpoint sources to restore and maintain the quality of the state's water resources.

A TMDL for a given pollutant and waterbody is composed of the sum of individual wasteload allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and natural background levels. In addition, the TMDL must include an implicit or explicit margin of safety (MOS) to account for the uncertainty in the relationship between pollutant loads and the quality of the receiving waterbody and may include a future growth (FG) component.

from the turbidity criterion using linear regression relationships between TSS and turbidity measured in the subsegments. In the third step observed loads (calculated by multiplying a measured pollutant concentration by the stream flow for that day) are plotted with the load duration curves made in step two. Percent reductions required to meet water quality criterion (or associated targets) are determined by reducing the measured concentrations until the observed loads are all less than the load duration curve value associated with the same flow. Finally the TMDL, MOS, FG, WLA and LA are calculated based on the reduced loads.

Table 1. Water quality standards for impaired subsegments included in this report.

Subsegment Number	Subsegment Name	Impaired Use ^A	Parameter Causing Impairment	Suspected Source of Impairment	Numeric Criteria from Standards
100309	Cross Bayou	DWS	Chloride	Unknown	75 mg/L
		DWS	Sulfate	Unknown	25 mg/L
		DWS	TDS	Unknown	150 mg/L
		FWP	Turbidity	Unknown	25 NTU ^B
		FWP	TSS	Unknown	-- ^C
100602	Boggy Bayou	FWP	Turbidity	Unknown	25 NTU ^B
		FWP	Sediment/siltation	Unknown	-- ^C
100603	Wallace Lake	FWP	Turbidity	Unknown	25 NTU
		FWP	Sediment/siltation	Unknown	-- ^C

Notes: A. DWS = Drinking Water Supply, FWP = Fish and Wildlife Propagation

B. The Louisiana water quality standards do not explicitly specify numeric criteria for turbidity for Cross Bayou and Boggy Bayou, but the criterion of 25 NTU for lakes was applied to these bayous because they drain directly into lakes.

C. TSS and sediment/siltation TMDLs were developed based on numeric criteria for turbidity. Each of the turbidity, TSS, and sediment/siltation TMDLs was expressed using a target TSS concentration as a surrogate for the turbidity criterion.

In TMDL development, allowable loadings for all pollutant sources are determined so that they add up to no more than the TMDL. WLAs account for permitted point source discharges. The LAs include background loadings and human-induced nonpoint sources. An explicit MOS of 10 percent (for chlorides, sulfate, and TDS TMDLs) and an FG component of 10 percent (for all the TMDLs) were also included. For the TSS TMDLs the MOS was implicit based on several assumptions, the most significant being treating TSS as a conservative parameter (i.e. assuming it does not settle out). A summary of the TMDLs for each of the subsegments is presented in Table 2.

Table 2. Summary of TMDLs for subsegments in this report.

Parameter	Subsegment Number	Subsegment Name	Loads (tons/day)					Percent Reduction Needed
			WLA	LA	MOS	FG	TMDL	
TSS, turbidity, and sediment/siltation (all expressed as TSS)	100309	Cross Bayou	0	2.07	0	0.23	2.30	89%
	100602	Boggy Bayou	0	4.35	0	0.48	4.83	97%
	100603	Wallace Lake	0	31.33	0	3.48	34.81	0%
TDS	100309	Cross Bayou	0	6.12	0.77	0.77	7.66	71%
Sulfates	100309	Cross Bayou	0	10.28	1.29	1.29	12.86	72%
Chlorides	100309	Cross Bayou	0	12.27	1.53	1.53	15.33	79%

For More Information

EPA seeks input on this proposed TMDL, including comments, information, and data from the general and affected public. For additional information on this TMDL project, please contact the EPA staff listed below:

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